Plant Location

The plants producing Propionic acid and syngas will be based in Morris, Il 60450. Team foxtrot based themselves in southern Illinois so as to be near Illinois coal basin number 6. As the syngas that team Foxtrot is producing is quite difficult and expensive to transport, in order to lower costs for both teams it has been decided that team Foxtrot and team Echo will be located next to each other. The determinant factor of team Echo’s location is Ethylene. Ethylene like syngas is quite expensive and difficult to transport. The region near southern Il was scoured to find ethylene production plants, and while the search lead heavily towards Texas and Louisiana eventually Lyondell Basell in Morris, Il was found and settled upon. In Morris, both teams have chosen to be located as close to a rail line as possible in order to minimize the coal transportation costs of team Foxtrot as team Foxtrot will currently be approximately 5 hours away from southern Il.

Morris, Il is a small town that is very historical yet not unwilling for progress. Not only is Morris home to Lyondell Basell and soon to be teams Echo and Foxtrot but it is also home to Dresden nuclear power plant which is one of many plants that supplies power to the Chicago land area. Bill Cheshareck is in charge of all building and zoning permits and is who must be contacted in order to determine what needs to be done in order for plants to be built in Morris.

<http://city.mornet.org/index.htm>  
<http://en.wikipedia.org/wiki/Morris,_Illinois>

Economic Evaluation

Propionic acid is used in many daily processes such as plastics and food preservatives and without it or an alternative to Propionic acid the quality of life would decrease. Propionic acid was chosen mostly due to its ability to preserve food and have it last longer. The longer shelf life that food has the more affordable it will become as food vendors will not have to throw away as much food, as their expiration times are increased by preservatives.

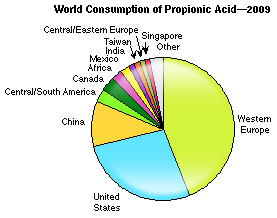


Figure ???: World Demand of Propionic Acid

In the above figure it can be seen that the United States is the second largest user of Propionic acid coming in second to Western Europe. As Western Europe is a region it can be inferred that the United States is the nation with the largest usage of Propionic acid. This information is encouraging to team Echo because it can be reasoned that because the U.S. is using so much Propionic acid that there must be a sizable demand for the product.

Figure ??? Price of Propionic Acid over the past decade

As can be seen in the above figure the price of Propionic acid has been steadily increasing over the past decade approximately doubling. This reinforces the idea that there is a great demand for Propionic acid. After all, with the increasing price and no decrease in the amount of Propionic acid used it can be inferred that it is very important and necessary. This is most likely due to the wide range of uses of Propionic acid. The relevance of establishing that there is a great demand for Propionic acid in this country is to determine the longevity of the project and whether or not it will pay out. The life of this project should be quite long as the demand for Propionic acid is not decreasing and is projected to rise over the next few years. As team Echo intends to target its sales towards food companies and the demand for food is always around without question, team Echo feels that this project will be profitable and long lasting.

|  |  |  |
| --- | --- | --- |
| Component | Price per year | Source |
| Ethylene | $ 7.84 million | Isis |
| Syngas | $150 thousand | DOE |
| Cooling Water | $ 22,000 | Aspen |
| Catalyst price |  |  |
| Project Capital Cost | $ 15.4 million | Aspen |
| Estimated Operating Cost | $3.74 million | Aspen |
|  |  |  |
|  |  |  |

Table ???: List of Costing Material

If all 33,000 tons of Propionic acid is sold each year then the process will gross approximately $ 29 million per year. This yearly gross price in conjunction with all of the costs that will be incurred are used to establish a breakeven point. The sooner the breakeven point occurs the sooner that the process will start making money.